RESUME

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EDUCATION

Doctor of Philosophy - Chemistry University of California, San Diego September 1976 - August 1981

Master of Science - Computer Science Johns Hopkins University September 1985 - July 1987

Bachelor of Arts - Chemistry University of Maryland, Baltimore County September 1972 - June 1976

BACKGROUND

Scientist I

Plasma Derivatives Department American Red Cross 15601 Crabbs Branch Way Rockville, MD 20855 October 1996 - present

Fibrin sealant forms a natural polymer matrix that makes an excellent local drug delivery system for drugs and/or biologics. My responsibilities were the development of research proposals, business plans, budgets, timelines and patents for novel uses for fibrin sealant.

Member of American Red Cross Task Force for implimentation of FDA regulations.

Research Fellow

Department of Molecular Biology American Red Cross 15601 Crabbs Branch Way Rockville, MD 20855 Research Director - Dr. Tom Maciag October 1990 - November 1995

Fibroblast Growth Factor (FGF) is a mitogen for cell type derived from mesodermal and neuroectodermal origins. Various in vitro and in vivo studies were performed to determine the mechanism of FGF action. These studies include the construction of FGF and FGF receptor vectors for the in vitro expression of these genes to elicit the secretion mechanism and signal transduction pathways of mitogenic activity and the in vivo expression of FGF to study the mechanism of angiogenesis. In vivo transfection studies to determine if a dominant-negative FGF receptor inhibits the repair processes after a balloon angioplasty.

Scientist II

Genetic Therapy, Inc. 19 Firstfield Road Gaithersburg, Maryland January 1989 - September 1990

Grant Awards

Small Business Innovation Research Program - Phase I - \$45,023

Title - Retroviral Vectors to Express -Interferon in Human TIL

A variety of cytokine constructions were made in retroviral backgrounds for expression in humans. These retroviral particles were used to infect Tumor Infiltrating Lymphocytes (TIL) cells to enhance the TIL cells cancer fighting abilities.

Scientist Associate

Laboratory of Chromosome Biology National Cancer Institute -Frederick Cancer Research Facility Frederick, Maryland June 1984 - December 1988 Research Director - Dr. Stuart Austin

The chromosome partition of the unit-copy plasmid of the bacteriophage P1 to daughter cells of <u>E</u>. <u>coli</u> was investigated by cloning the partition region of P1 into the vector pBR322. Partition defective mutations were constructed <u>in vitro</u> in these clones. <u>E</u>. <u>coli</u> host mutations were also isolated and are presently being characterized. Other studies examined the regulation of the P1 partition operon by constructing protein and operon fusions to --galactosidase. Regulation defective mutations were isolated and characterized by DNA sequencing.

Postdoctoral Fellow Chemistry Department University of Maryland, Baltimore County September 1981 - May 1984 Research Director - Dr. John Hays

The effects of the Gam gene product on <u>E</u>. <u>coli</u> was investigated by cloning <u>gam</u>. The Gam gene product was found to specifically inhibit the nuclease activity of <u>recBC</u> in <u>vivo</u> and <u>in vitro</u>. <u>RecBC</u> mediated recombination, which was measured by HFr mating, P1 transduction and Chi crosses, was not inhibited by <u>gam</u>.

Graduate research Assistant

Chemistry Department University of California, San Diego September, 1976 - August, 1981 Research Director - Dr. John Leong

The mode of action of the transition metal chelating antibiotic, thioformin was investigated. The transition metals were found to stimulate cellular uptake of radioactively labeled thioformin. Attempts were made to determine the target of the antibiotic by measuring in vivo inhibition of cellular processes in the presence of the antibiotic. Some of the processes examined were ATP, ppGpp and pppGpp levels, O₂ consumption, and the synthesis of DNA, RNA, and proteins. The antibiotic induced a shift-down by effecting energy production.

Undergraduate Research Assistant

Chemistry Department University of Maryland, Baltimore County December, 1974 - August, 1976

The membrane bound sugar transport system of <u>Staphylococcus</u> aureus was examined by purification and characterization of the enzymes involved in the process. <u>In vivo</u> and <u>in vitro</u> enzyme kinetic studies were performed.

Supervision and training of a graduate student

PUBLICATIONS

- 1. Friedman, S.A. and J.B. Hays. 1977. Initial characterization of hexose and hexitol phosphoenolpyruvate-dependent phosphotransferases of *Staphylococcus aureus*. J. Bacteriol. 130:991.
- 2. Friedman, S.A., R.M. Cooper, and J.B. Hays. 1977. The same reversible aggregating soluble protein is required for PEP-dependent phosphorylation of mannitol and sorbitol in *Staphylococcus aureus*. FEMS.1:311.
- 3. Bell, S.J., S.A. Friedman, and J. Leong. 1979. Antibiotic action of N-methylthioformohydroxamate metal complexes. Antimicrob. Agents Chemother. 15:387.
- 4. Hays, J.B., T.A.G. Smith, S.A. Friedman, E. Lee, and G.L. Coffman. 1984. RecF and RecBC functions during recombination of non-replicating, UV-irradiated phage DNA and during other recombination processes. Cold Spring Harbor Symp. Quant. Biol. 49:475-483.
- 5. Abeles, A.L., S.A. Friedman, and S.J. Austin. 1985. Partition of unit-copy miniplasmids to daughter cells III. The DNA sequence and functional organization of the P1 partition region. J. Mol. Biol. 85:261-272.
- 6. Friedman, S.A., and J.B. Hays. 1986. Selective inhibition of *Escherichia_coli* RecBC enzyme functions by plasmid-encoded phage Gam activity. Gene. 43:255.
- 7. Austin, S., S. Friedman, and D. Ludtke. 1986. The partition functions of three unit-copy plasmids can stabilize the maintenance of plasmid pBR322 at low copy number. J. Bacteriol. 168:1010-1013.
- 8. Friedman, S., K. Martin and S. Austin. 1986. The partition system of the P1 plasmid. In:Banbury Report 24:Antibiotic Resistance Genes: Ecology, Transfer, and Expression (S.B. Levy and R.P. Novick, eds.). Cold Spring Harbor Laboratory, Cold Spring Harbor, New York, pp. 285-295.
- 9. Martin, K.A., S.A. Friedman, and S.J. Austin. 1987. The partition site of the P1 plasmid. Proc. Natl. Acad. Sci., USA. 84:8544-8547.
- 10. Friedman, S.A., and S.J. Austin. 1988. The P1 plasmid-partition system synthesizes two essential proteins from an autoregulated operon. Plasmid 19:103-112.
- 11. Zhan, X., X. Hu, S. Friedman, and T. Maciag. 1992. Analysis of Endogenous and Exogenous Nuclear Translocation of Fibroblast Growth Factor-1 in NIH 3T3 Cells. Biochem. Biophys. Res. Comm. 188:982-991.
- 12. Jackson, A., S. Friedman, X. Zhan, K.A. Engleka, R. Forough, and T. Maciag. 1992. Heat shock induces the release of fibroblast growth factor 1 from NIH 3T3 cells. Proc. Natl. Acad. Sci. USA 89:10691-10695.
- 13. Forough, R., X. Zhan, M. MacPhee, S. Friedman, K.A. Engleka, T. Sayers, R.H. Wiltrout, and T. Maciag. 1993. Differential Transforming Abilities of Non-secreted and Secreted Forms of Human Fibroblast Growth Factor-1. J. Biol. Chem. 268:2960-2968.
- 14. Friedman, S., X. Zhan, and T. Maciag. 1994. Mutagenesis of the Nuclear Translocation Sequence in FGF-1 Alters Protein Stability But Not Mitogenic Activity. Biochem. Biophys. Res. Comm. 198:1203-1208.
- 15. Maciag, T., X. Zhan, S. Friedman, S. Garfinkel, I. Prudovsky, A. Jackson, J. Wessendorf, X. Hu, S. Gamble, J. Shi, S. Brown, F. Tarantini, and A. Zimrin. 1994. Novel Mechanisms of Fibroblast Growth Factor-1 Function. Prog. Hormone Res. 49:105-123.

- Jackson, A., F. Tarantini, S. Gamble, S. Friedman, and T. Maciag. 1995. The Release of Fibroblast Growth
 Factor-1 from NIH 3T3 Cells in Response to Temperature Involves the Function of Cysteine Residues. J. Biol.
 Chem. 270:33-36.
- 17. Imamura, T., S. Friedman, S. Gamble, Y. Tokita, S.R. Opalenik, J.A. Thompson, and T. Maciag. 1995. Identification of the Domain Within Fibroblast Growth Factor-1 Responsible for Heparin-dependence. Biochim. Biophys. Acta 1266:124-130.
- 18. Finch, P.W., L.K. Yee, M.Y.W. Chu, T.M. Chen, M.H. Lipsky, T. Maciag, S. Friedman, M.H. Epstein, and P. Calabresi. 1997. Inhibition of Growth Factor Mitogenicity and Growth of Tumor Cell Xenografts by a Sulfonated Distamycin A Derivative. Pharmacology 55:269-278.
- 19. Shi, J., S. Friedman, and T. Maciag. 1997. A Carboxyl-Terminal Domain in Fibroblast Growth Factor (FGF)-2 Inhibits FGF-1 Release In Response to Heat Shock *In Vitro*. J. Biol. Chem. 272:1142-1147.
- Jackson, M.R., S.A. Friedman, A.J. Carter, V. Bayer, J.R. Burge, M.J. MacPhee, W.N. Drohan, and B.M. Alving. 1997. Hemostatic Efficacy of a Fibrin-based Topical Agent in a Femoral Artery Injury Model: A Randomized, Blinded, Placebo-controlled Study. J. Vas. Surg. 26:274-280.

Patents

MacPhee, M., W.N. Drohan, D. Beall, S. Friedman, D. Tuthill, and V. Bayer. 1998. Hemostatic Sandwich Bandage. Patent Pending